
MORPHOLOGICAL MODELING AND BIO-KINETIC ABILITIES AND SKILL OF YOUNG HANDBALL CORNER PLAYERS

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Abstract

The purpose of this paper is to identify the morphological specifications and bio-kinetic and skill capabilities of the handball corner player, design a model (lateral shape) of the morphology, bio-kinetic and skill capabilities of the handball corner player, and identify the ideal (lateral shape) model for handball corner players. The researcher adopted the descriptive survey method because it suits the nature of the research. The corner Center players were determined in the youth handball category for the Middle Euphrates clubs for the 2023-2024 sports season. They numbered (40 players), and the entire community was chosen to be the research sample. One of the most important results reached by the researcher is that: From the results, the dominant style of corner players is the muscular style, through the model using the profile grid of the sample members; it was found that there are somewhat low levels in terms of bio-kinetic abilities in handball.

Keywords: morphological modeling, bio-kinetic abilities and skill:

Introduction:

The natural sciences are usually concerned with discovering something about a certain phenomenon that is supposed to actually exist in the real world. Whatever the phenomenon that we want to understand and explain, we try to do so by collecting data from the real world, and using this data to draw conclusions about the phenomenon. The available data is dealt with and used in a meaningful way, and this often includes building the statistical models that are being studied.

Handball is one of the group games that has gained widespread popularity despite the game's newness compared to other games over the past few years. This spread came about due to the development-taking place in the game through the speed in performing basic skills and the diversity of the teams' collective plans. Modern technology and continuous development are the main factors that have made the game of handball take good steps towards progress. The justification for the reason for building statistical models for real-world data is similarity or analogy. When we want to predict a specific phenomenon, we collect data from the real world. We look at that phenomenon in the real world and collect data about it. Then we use that data to create a model of the phenomenon. This model may differ from the real phenomenon,

but we try to build a model that fits perfectly. Points of interest Depending on the available data, after the model is built, it can be used to predict the phenomenon in the real world.

The diversity of the basic skills in the game of handball and the repetition of their performance during play contributed greatly to giving it specificity and within the different playing positions, whether in the front line (the two corners and the center) or in the back line (the forearms and the middle), in addition to the goalkeeper. This diversity is imposed on workers in the game. The field of the game of handball, represented by coaches, is training the players physically, skillfully, and tactically for the purpose of raising the physical and skill level to levels that exceed the capabilities of the competitor, based on the physical measurements specific to the game, in addition to the aforementioned requirements. The ideal performance of the handball player cannot be achieved unless the characteristics and special features of the requirements are available. In the game of handball, the first step begins with careful selection of sports materials according to the standards of the game, followed by refining those standards and working to develop them gradually, leading to precise and varied training in accordance with the specificity of each playing center.

The process of shedding light on selection in the game of handball represents the first step in the sound scientific direction of developing the player, as through this it is possible to predict in the future the anthropometric measurements, the physical and kinetic capabilities, and the basic skills of the handball player according to each position, and this prediction is based on precise scientific standards that move away from Randomness, artificiality, and chance, in order to save the efforts and expenses made by the player and the coach and reach high levels of ideal performance in the game of handball. The importance of this research lies in establishing the profile of the corner player in the aspects of morphology, bio-kinetic abilities, and skill. The position of the corner player in handball, which is his contribution from the researcher, is added to the series of contributions of previous researchers in the service of the game of handball in Iraq.

Research problem:

The position of the corner player (winger) in handball is one of the important positions through which the player is able to determine the efforts of his fellow players, represented by delivering the ball to him and translating those efforts into scoring a goal. The morphological measurements and bio-kinetic and skill abilities are what distinguishes this player, especially in conditions of close proximity. The defensive and offensive levels of the players of both teams, which makes it a deciding factor for his team and constitutes the process of clarifying the determinants on which high achievement is based in terms of choosing the best.

Through the researcher's experience as a former player and follower of the Iraqi league and other handball leagues, he noticed that there is sufficient information about the specifications of the corner player, but it was not classified in the form of standards and models for the requirements of morphology, bio-kinetic abilities, and

skill. This helps coaches in finding the appropriate player to fill this position, so the researcher went through this experience from during the selection of handball corner players according to morphological specifications and bio-kinetic and skill capabilities, to reduce effort and save time for the coaches.

Research objective:

- Identify the morphological specifications and bio-kinetic and skill capabilities of the handball corner player.
- Design a model (lateral shape) of the morphology, bio-kinetic and skill capabilities of the handball corner player.
- Identify the ideal (lateral shape) model for handball corner players.
- Identify standard levels for the variables investigated for handball corner players.

Research fields:

- Human field: Corner Center players, youth handball category, for the Middle Euphrates clubs for the 2023-2024 sports season.
- Time field: (12/8/2023) to (22/1/2024)
- Spatial field: Closed halls of Middle Euphrates clubs.

Research methodology and field procedures:

Research Methodology:

The researcher adopted the descriptive survey method because it suits the nature of the research.

Community and sample research:

The corner center players were determined in the youth handball category for the Middle Euphrates clubs for the 2023-2024 sports season. They numbered (40 players), and the entire community was chosen to be the research sample.

Field research procedures

Determine morphological measurements:

For the purpose of explaining the measures taken regarding determining the research variables concerned with (morphological measurements), the researcher will attempt to review what has been taken in terms of applied contexts, according to the following sequence:

Procedures for morphological specifications required to evaluate body type:

To evaluate the body type of handball players, the researcher used the anthropometric body type method using mathematical equations (Heath-Carter), as it is one of the most common methods due to its accuracy and objectivity, as well as being one of the inexpensive methods, and it relies on the following measurements (Hassanein. 1998).

First: Height (in centimeters):**Second: Weight (kg):****Third: Skin fold thickness measurements:**

- Take all measurements on the side of the body that the player uses.
- The measurement was done from top to bottom as follows: behind the upper arm, under the plate, above the iliac bone, and the calf, and this sequence was the norm.
- The person conducting the measurement was standardized, and he was familiar with the method of using the device and the locations of the measurement.
- It was taken into account that the position of the laboratory body during the measurement conforms to the instructions, as well as the member or part that includes the target measurement area.
- The proper method of performing the measurement process was taken into account in terms of touching the device and holding the skin fold for defining the places for measuring the thickness of the skin folds used to evaluate the body type (Hassanein. 1995).
- Thickness of the skin fold behind the humerus: - Thickness of the skin fold below the plate: - Thickness of the skin fold at the iliac protuberance: - Thickness of the skin fold of the calf:

2- Fourth: Display measurements: Width between the two condyles of the humerus:

- Width between the two condyles of the femur: - Fifth: Circumference measurements: - Humerus circumference- Calf circumference:

Determining the bio-kinetic and skill abilities of the handball corner player and their tests:

The bio-kinetic abilities represented by (explosive force, strength characterized by speed, transitional speed, flexibility, and agility) and their tests were identified, as well as the basic skills and their tests represented by (the skill of holding the ball, the skill of passing and receiving, the skill of deception, and the skill of shooting). And its tests, after reviewing many scientific sources and references, were presented to handball specialists, who numbered (15) experts, and approval was obtained by (100%).

Table (1) shows bio-kinetic abilities and their tests

No.	Bio-kinetic and skill abilities	Tests
1	Explosive ability of the arms	3kg medicine ball throwing test
2	Explosive ability of the legs	Long jump stability test
		Sargent test
3	The distinctive speed ability of the arms	Flexion and extension test for 10 seconds
4	The distinctive speed ability of the legs	Side jump test on the platform 10 seconds

5	Transitional speed	30 meter running test
6	Agility	Barrow test
7	Flexibility	Testing the flexibility of torso rotation to the sides
		Spinal flexibility test
8	Compatibility	Numbered circuit test
9	Balance	A test for moving over the marks
10	Catch the ball	Test of holding the ball with the distinct hand for 10 seconds
11	Passing and receiving	Passing test and hold against the wall for 30 seconds
12	Shooting	Testing aiming accuracy after performing a deception
		Angle shooting test

Exploratory experience:

The researcher conducted the exploratory experiment on a sample of (4) players selected from the handball players of Al-Qassim Sports Club on 8/20/2023 in the hall of the Al-Qasim Youth Forum, and after 8 days had passed, the same experiment was repeated on individuals who met them on 8/28/ 2023) for the purpose of identifying:-

- The length of time required to perform the tests.
- The validity of the auxiliary tools used and their suitability to the research sample.
- The extent of the players' readiness to carry out the tests.
- Arrange the sequence of applying tests for the research variables.
- The adequacy of the supporting work team in how to implement the tests and use the tools.
- Diagnosing the errors and obstacles that will appear in the main experiment and overcoming them.

Scientific foundations of tests:

Validity of the test: Validity is "the accuracy with which the test measures the purpose for which this test was developed." (Kmarsh. 2002). Validity is one of the important characteristics that must be characterized by a good test. A test that does not have a good degree of validity cannot perform. His job: For the purpose of extracting the validity of the nominated tests, the researcher presented the contents of the tests to a group of experts, and thus the researcher obtained the validity of the content, which is often done "by logically judging the presence of the trait, trait, or ability in question to investigate whether the proposed measurement method actually measures it or not." (Allawi and al-Din Radwan. 2000).

stability of the test: In order to extract the second scientific coefficient for the nominated tests, the principle of constant testing must be applied, "which is the test that gives close results or the same results if applied more than once in identical conditions" (Al-Zyoud and Alyan. 2005), and it has been used to calculate the

stability coefficient. (Test and retest method) with a time interval between the first and second tests (8) days. The researcher extracted the reliability coefficient through the simple correlation coefficient (Pearson) between the results of the first test and the second test, as shown in Table (2).

Objectivity: Objectivity is defined as “the extent to which the arbitrator or examiner is free from subjective factors.” (Farhat.2001), and for the purpose of ensuring the objectivity of the nominated tests, the researcher sought the help of arbitrators when conducting the exploratory experiment and then extracted the simple correlation coefficient (Pearson) between the arbitrators’ scores. As shown in Table (2).

Table (2) shows the stability coefficient and objectivity coefficient for the tests

No	Tests	Stability coefficient	Sig	Objectivity coefficient	Sig
1	3kg medicine ball throwing test	0,88	0.000	0,92	0.000
2	Long jump stability test	0,85	0.000	0.89	0.000
3	Sargent test	0,92	0.000	0.91	0.000
4	Flexion and extension test for 10 seconds	0.82	0.000	0.91	0.000
5	Side jump test on the platform 10 seconds	0.85	0.000	0,88	0.000
6	30 meter running test	0.84	0.000	0.90	0.000
7	Barrow test	0.91	0.000	0.89	0.000
8	Testing the flexibility of torso rotation to the sides	0.86	0.000	0,85	0.000
9	Spinal flexibility test	0.89	0.000	0,92	0.000
10	Numbered circuit test	0.83	0.000	0.86	0.000
11	A test for moving over the marks	0.82	0.000	0.89	0.000
12	Test of holding the ball with the distinct hand for 10 seconds	0.92	0.000	0.92	0.000
13	Passing test and hold against the wall for 30 seconds	0.80	0.000	0.91	0.000
14	Testing aiming accuracy after performing a deception	0.90	0.000	0.86	0.000
15	Angle shooting test	0.81	0.000	0.90	0.000

Conducting tests and measurements:

The researcher conducted measurements and tests for the research sample, and this process continued for the period from 9/2/2023 to 9/23/2023, and then transcribed the data into the final transcription forms.

Statistical methods:

- Arithmetic mean.
- Standard deviation.
- Simple correlation coefficient.
- Heath-Carter equation.
- Standard score.

Results and discussion:

Presentation, analysis and discussion of the results of morphological indicators (body types):

Table (3) shows the results of the dominant body types for the corner position (wing) among youth handball players (research sample) after the anthropometric body type method was used using mathematical equations (Heath-Carter). The table indicates that the dominant body type for the corner position Angle is a muscular pattern.

Table (3) shows the physical types (obesity, muscularity, thinness) for the center angle of the handball

Samples	Somatotypes						Total
	Obesity		Muscularity		Thinness		
	Count	Percentage	Count	Percentage	Count	Percentage	
Corner	6	% 15	23	% 57.50	11	% 27.50	40

Table (3) shows the results of the physical types for the corner center, where the obese type was (6) with a percentage of (15%), the muscular type was (23) with a percentage of (57.50%), and the thin type was (11) with a percentage of (27.50%), which means that the dominant body type The center of the corner is the muscular style, and this is consistent with what (Yasser Muhammad Al-Dabbour) stated, when he said, “The prevailing style in handball is the muscular style” (Al-Dabbour. (1996) The corner player is considered very important and the most rare, due to the many requirements for this position, as the most important of these requirements is his possession of a muscular style that is commensurate with the importance of this position and the tasks assigned to him, as the situations of constant contact with the players of the opposing team and the abundance of pressure on him, in addition to the constant contact. And violent in most cases, all of this requires that this player possess special specifications that enable him to occupy this position, as (Abdul Wahab Ghazi)points out that morphological measurements “are among the most influential factors in performance and are important and linked to the level of athletic achievement in all sporting activities, as they determine the extent of effectiveness.” And the adequacy of the individual’s final performance, which has recently called for conducting numerous researches to analyze the individual’s physical characteristics and classify his abilities, and then attempt to set standards and tests in various aspects in order to reach the highest levels in all activities.(Ghazi , 1990) Hence the great

importance of specialization from the physical (morphological) aspect, as (Zakaria Muhammad Hassan) points out: “Every sports game has special physical specifications that must be taken into account when making the selection.”(Hassan , 1987)

Presentation, the results of the arithmetic means and standard deviations for bio-kinetic and skill abilities:

Table (4) shows the results of the arithmetic means and standard deviations of the tests

No.	Tests	Measuring unit	Arithmetic means	Standard deviations
1	Throwing a 3 kg medicine ball	Meter	6.50	1.06
2	Vertical jump sargent	Cm	48.5	6.11
3	Broad jump from standstill	Meter	220.1	18.04
4	Bend and extend the arms for 10 seconds	Count	13.01	2.91
5	Side jump from the platform 10 seconds	Count	11.24	2.24
6	run 30 meters	Second	4.51	0.31
7	Flexibility of torso rotation to the right sides	Cm	42.31	12.55
8	Flexibility of torso rotation to the left side	Cm	39.21	12.14
9	Spinal flexibility	Cm	35.87	1.87
10	Barrow agility test	Second	23.52	2.67
11	Numbered circuit test	Second	8.37	0.57
12	A test for moving over the marks	Degree	7.71	0.67
13	Passing and receiving	Count	24.35	3.24
14	Catch the ball	Count	13.15	1.88
15	Shooting and deception	Degree	2.21	0.54
16	Shooting from the angle	Degree	8.43	1.98

Presentation , the model with lateral shape ranges for bio-kinetic abilities and skill tests:

Table (5) shows the model with the ranges of the profile of the bio-kinetic abilities and skill tests

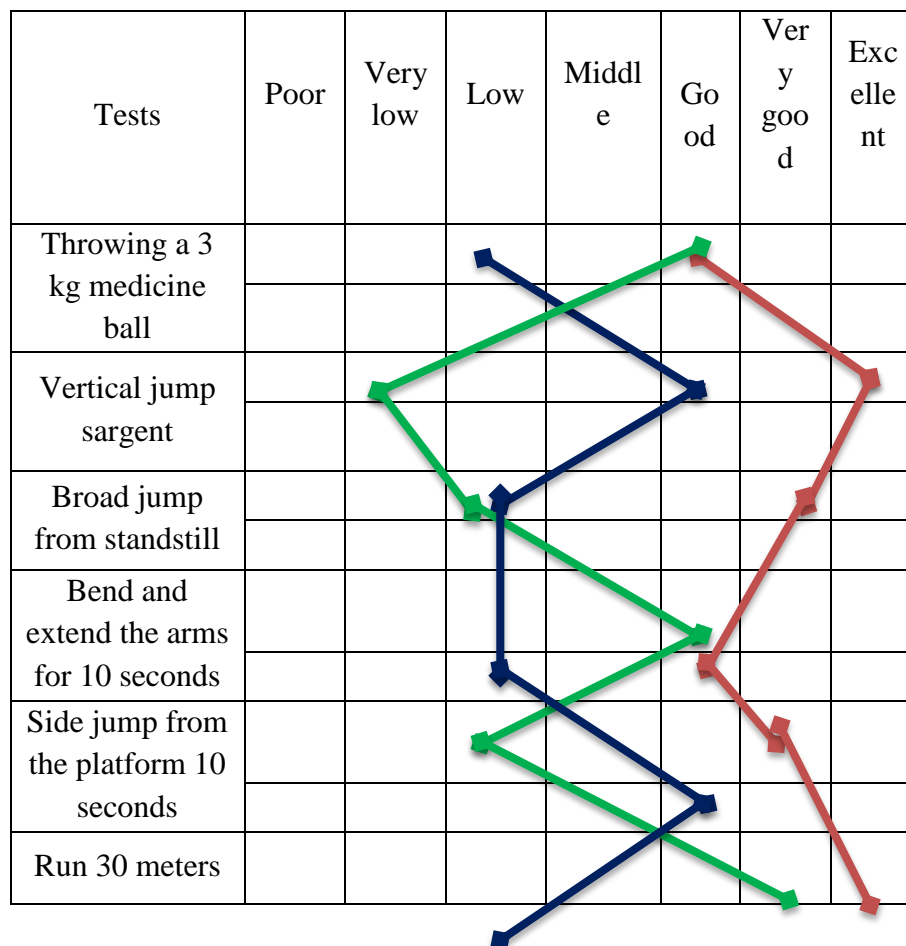
Tests	Excellent	Very good	Good	Middle	Low	Very low	Poor
Throwing a 3 kg medicine ball	8.69	7.61	7.05	5.97	5.44	4.37	3.30
	9.76	8.65	7.58	7.04	5.96	5.43	4.36
Vertical jump sargent	60.6	54.7	51.6	45.61	42.54	36.43	30.33
	67.7	60.8	54.7	51.71	45.58	42.53	36.42
Broad jump from standstill	256.16	238.06	229.03	210.96	201.93	183.87	165.82
	274.19	256.11	238.05	229.02	210.95	201.92	183.86
Bend and extend the arms for 10 seconds	18	15	13	11.54	9	7	4
	21	18	15	14.44	11	9	7
Side jump from the platform 10 seconds	15	13	11	10.12	8	7	5
	17	15	13	12.37	9	8	6
Run 30 meters	3.86	4.18	4.67	4.36	4.84	5.17	5.51
	3.54	3.87	4.21	4.68	4.37	4.85	5.18
Flexibility of torso rotation to the right sides	67.43	54.87	48.58	36.01	29.72	17.16	4.61
	80.01	67.42	54.86	48.57	36.02	29.71	17.15
Flexibility of torso rotation to the left side	63.4	51.3	45.2	33.14	26	14	3
	75.6	63.4	51.3	45.31	32	26	14
Spinal flexibility	39.65	37.77	36.82	34.93	34.01	32.10	30.22
	41.53	39.64	37.76	36.81	34.92	33.98	32.11
Barrow agility	18.16	20.84	24.85	22.18	26.20	28.87	31.54
	15.50	18.17	20.85	24.86	22.21	26.21	28.88
Numbered circuit test	6.22	7.10	7.89	8.15	9.47	11.41	12.73
	6.03	6.72	7.20	9.32	9.12	10.87	11.46
A test for moving over the marks	8.11	7.60	7.05	6.17	4.28	3.77	3.10
	8.04	7.88	7.69	6.90	4.93	4.22	3.03
Passing and receiving	31	28	26	22.72	20	17	14
	33	30	27	25.98	22	20	17
Catch the ball	17	14	14	12.21	10	9	7

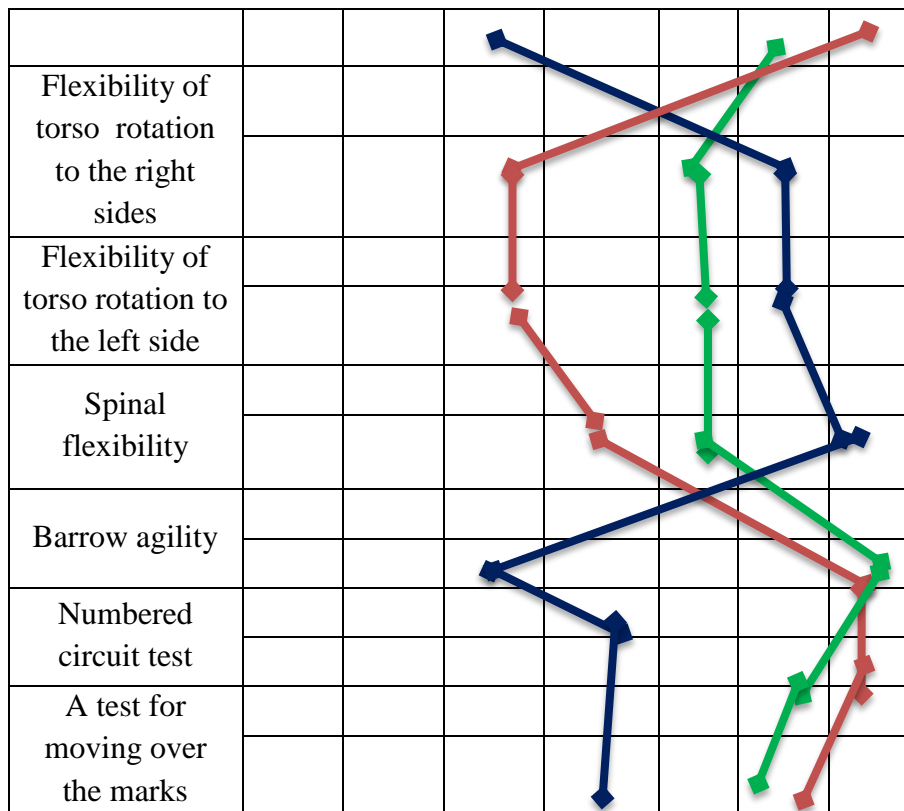
	18	15	14	14.11	12	10	8
Shooting and deception	3	3	3	1.91	2	1	1
	3	3	3	2.46	2	2	1
Shooting from the angle	11	10	10	7.43	6	4	2
	13	11	10	9.43	6	5	3

Analysis of the results of the model (lateral network) in tests of kinetic abilities:

By representing the results of the three players themselves, whose results were chosen to identify the work of the lateral shape network designed by the researcher, the first player who was classified as a very good player in morphological measurements (muscular pattern), we find here he is distinguished by his proficiency in tests of bio-kinetic abilities, especially the variables of speed and strength. Explosiveness, agility, and flexibility. As for the second player, his results are still around the average. Other than that, his results in the flexibility variables were very good, as his results in the flexibility tests fall in the right side. Finally, the third player shows relatively good results, especially in the speed and flexibility tests, but he He suffers from some weakness in the explosive abilities of his legs.

Diagram (1) shows three levels for three players in the bio-kinetic abilities network





Discussing the results of the model using the lateral network in bio-kinetic abilities:

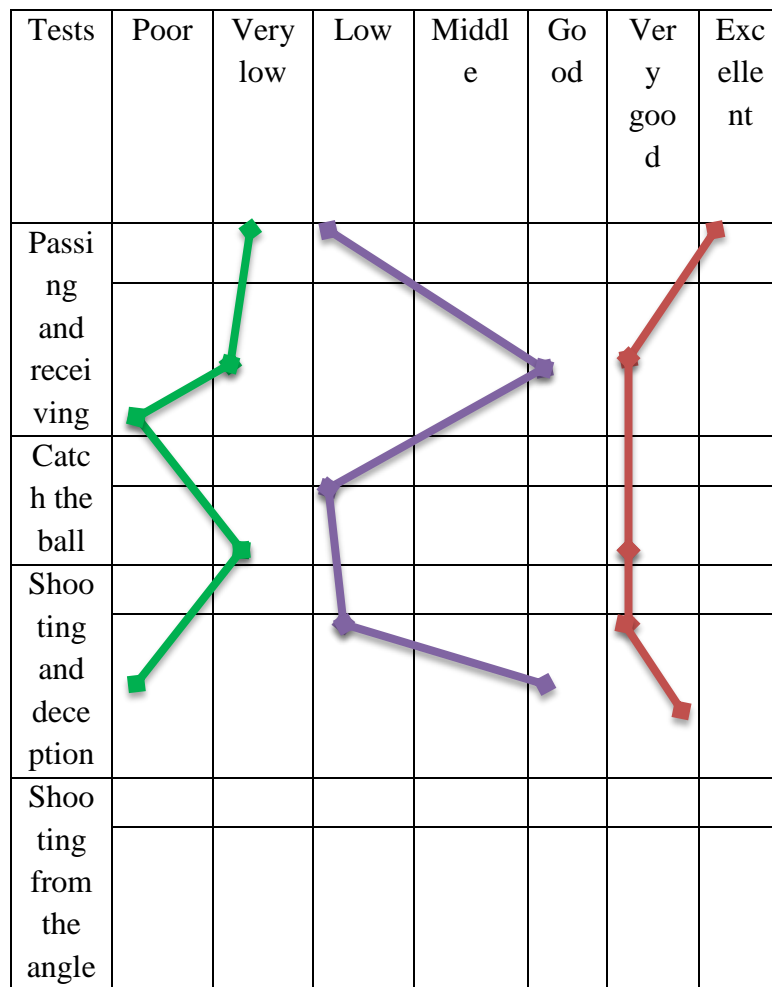
Bio-kinetic abilities, along with morphological specifications, form the base of the pyramid on which skill and tactical abilities are based. “We find that the type of sporting activity that an individual practices and in which he aims to achieve the highest levels is what determines the type of physical and skill components necessary for the activity. There is also a close connection between developing Physical components and development of kinetic skills. For example, a player cannot master jumping movements if he lacks leg strength.”(Adel Abdel Basir. 1999) . Likewise, the player cannot twist the torso in deception movements, change direction, and go down to catch low balls without flexibility of the spine, especially in light of the modern morphological requirements of the corner player. The handball game is distinguished from other team games by an important feature, as it is called “the moving arena and field, as it combines the famous arena and field trinity “faster - higher - farther” (Al-Khayyat, and Ghazal, 1988). As for naming the corner player (winger), according to the researcher’s opinion, it came as a result of the team’s performance being centered around this player. It is not enough for the player in this position to possess physical abilities at a level similar to the rest of the players, as it is difficult for a player who is physically and physically weak to escape tight supervision. He receives balls, jumps sideways, and shoots, thus increasing his basic requirements for running, jumping, and throwing. From this standpoint, attention to

the general and specific physical fitness elements of this player and their development has been the first concern of all handball coaches in the world, as it represents the first pillar of success in performing the basic kinetic skills of the corner player. Indeed, the connection between physical fitness and the basic kinetic skills of the game is large and has been confirmed by scientific studies and field research. Performing skills requires physical abilities to accomplish them, and practical reality indicates that no skill is devoid of one or more physical components. (Muhammad Tawfiq Al-Waleili) confirms, “The depth of this connection between skills and physical fitness when he demonstrates (There is a correlation between the level of kinetic performance of handball skills and the level of physical fitness) (Al-Waleili , 1989).

Analyzing the results of the model using the lateral network in skill ability tests:

Through the profile networks, it is possible to identify in an individual way the capabilities possessed by the player who falls within this network, as comprehensiveness is very required, especially for a player such as the corner player, as (Owais Al-Jabali) confirms that the comprehensive training process must include in its models the objective and effective foundations of the process of individual characteristics as a nature. Human, the process of individual characteristics is not limited to correcting and amending the training plan or placing the player in a position in the team, but extends to include objective observation of the player and meeting his needs and the maximum limits of his abilities (Al-Jabali , 2001). The researcher believes that profile networks are an excellent example of representing the players’ abilities and capabilities as well as monitoring their levels. Returning to the models of the players whose side grids were drawn using the profile grid prepared by the researcher, one look at the diagram of their side grids is sufficient for the coach to be able to identify all of their levels, as we find that the values of the first player all fall within the good range (on the right side), while the other player, The values of his results in these tests are centered around the arithmetic mean, and as for the third player, all his values are located to the left, which indicates his severe weakness in basic skills.

Diagram (2) shows three levels for three players in the skill abilities network



Discussing the results of using the network in skill abilities:

It is certain that skills are one of the basic components and an important factor for implementing plans and deciding the match. Without proficiency in skills to a high degree, the task of implementing plans will become difficult, making it difficult for the player to perform the match in the desired manner. Skills, in turn, affect the player’s physical and tactical ability, as (Zaki Muhammad Muhammad Hassan) pointed out that skill is in activity. The athlete is the core of performance for this activity. (Hassan, 1989) But here the researcher emphasizes that skill is more of an acquired factor than the rest of the components (morphological specifications and bio-kinetic abilities), as most of them are inherited, such as total length and type of muscle fibres. The researcher believes that the player’s possession of basic skills is an important and major factor, and is sometimes considered decisive in achieving results, especially The corner player because he is forced to change his position and role during the game according to what the match situations require of him and his rapid transition from defense to attack and vice versa, as (Muhammad Sobhi Hassanein and Hamdi Abdel Moneim) confirm that the basic skills are the movements that the

player must perform under all the circumstances and situations that... The game requires it to reach the best results while saving effort. (Hassanein and Moneim, 1988), but at the level of selection, the player, especially the young player who is characterized by distinct morphological measurements and bio-kinetic abilities, can be predicted to possess skill abilities in the future, and the researcher agrees in this regard with what (Yarab Khayoun) said in "Individuals show special abilities and qualities in behavior as a result of "Genetics gives some individuals a preference for success in some kinetic skills." (Khayoun, 2002).

Conclusions and Recommendations:

Conclusions:

- From the results, the dominant style of corner players is the muscular style.
- Through the model using the profile grid of the sample members, it was found that there are somewhat low levels in terms of bio-kinetic abilities in handball.
- Through the model using the profile grid of the sample members, it was found that there were slightly higher than average levels in terms of handball skill abilities.

Recommendations:

- Adopting the model using the side shape as a type of modern scientific selection methods.
- Adopting the model using the sides prepared by the researcher as a modern local model and in accordance with international specifications, which can be relied upon in determining the best morphological measurements suitable for the corner player.
- If the results of the players' measurements match the upper limit and the right side of the designed grid, this can compensate for some other shortcomings that can be developed during training, such as some bio-kinetic and skill abilities.
- Adopting the profile grid in determining the players who can occupy the corner player position.
- Taking into account the tests and measurements involved in the research while initiating the process of developing training plans and educational programs for handball players of different categories.

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